

08/12/2002

To: Federal Communications Commission
From: IEEE/Power System Relaying Committee

In the matter of NPRM FCC 02-136, ET Docket No. 02-98:
Proceeding to allocate new frequency bands to the Amateur Radio Service:

The IEEE/Power System Relaying Committee (IEEE/PSRC) appreciates the opportunity to submit comments in reply to the remarks of Mr. W. Lee McVey.

While Mr. McVey appears to have a background in Power System Protection, he is very opinionated. It is essential that evaluation of the possible interaction between amateur radio and power line carrier (PLC) be focused on the facilities currently used by utilities. Not the opinions of what utilities should use.

Mr. McVey suggests that PLC is both "primitive and simplistic", as well as both "insecure and less reliable" than other available communication means. His conclusion indicates that the possible "impact has been exaggerated" and PLC "should be replaced by more secure and reliable media". He indicated that electromechanical protection devices should be replaced by modern microprocessor devices that do not use PLC.

It is essential that the FCC not sway from its understanding that PLC is widely employed. PLC is very reliable. PLC is not obsolete and PLC is inexpensive. PLC works with all types of protective systems both old and new. PLC systems need not be changed when a utility modernizes their line protection. PLC is used to protect the nation's power system. This can easily be verified.

In Mr. McVey's reply comments he indicates that PLC is not a protective device. He refers to it as a "conduit". It is important to understand that although it is a "conduit" between stations, it can incorrectly operate or prevent proper operation of a breaker. Either of these situations can lead to a localized or wide area power outage.

Comments indicate that direct transfer trip (DTT) and directional comparison relaying (DCR) are not used with modern protection devices. This is not true. We recommend consulting with the IEEE-C37.113 "IEEE Guide for Protective Relay Applications to Transmission Lines". Comments to the NPRM from utilities throughout the US as well as the UTC validate widespread use of PLC.

Mr. McVey is correct that PLC is simplistic. It is based on old technology. Even though the new systems use digital signal processing, they use the same modulation techniques of on-off and frequency shift keying (FSK). While other techniques have been attempted, as well as narrower channels, speed and reliability has always been an unacceptable tradeoff. PLC is a non-intentional radiator, hence, PLC is unlicensed. PLC has no allocation. PLC operates under part 15 on a shared basis. All implementations of systems and product designs are based on the current status of the spectrum.

In Mr. McVey's reply comments he asks the question "If PLC is the end-all to power system reliability, why then, are fiber optic and microwave paths used?". It is the responsibility of the electric utility to deliver power at the least cost and highest reliability. Most utilities have standardized on a DCR/DTT scheme utilizing two channels of PLC on a single conductor for voltages under 200 kV. For voltages over 200 kV, two systems of protection are generally used. The two systems may both use PLC on two separate power conductors, or use PLC and another media. When two systems are used, two different and independent fault detection techniques are used. They operate in an "or" logic configuration. If either system falsely operates the line will be disconnected from the grid. PLC is primary protection and not a back up. Mr. McVey feels "it should be".

Fiber and Microwave are very expensive. Fiber end equipment can provide more than just protection such as telemetry, video security, and voice. In some cases these expansive networks can save a utility money. However the fiber itself can cost upwards of \$80,000 per mile when the utility has the right of way. To protect a long line with limited channel needs is cost prohibitive. Many utilities obtained fiber in tandem with telecommunications companies offsetting their cost. In many cases utilities paid nothing, exchanging dark fibers for right of way. Having only to pay for the end equipment, fiber systems become very attractive. However, the use of fiber channels for protection does not dominate PLC.

A Microwave link typically needs to be under 30 miles for flat geography conditions. Similar to Fiber systems, Microwave can support many channels. The cost for a typical equipment building and a 200 foot guyed tower is \$500,000 per site.

PLC at a \$100,000 per line end is much more cost effective in most cases. Hence, utilities first look at using PLC. It appears that Mr. McVey's comments are attempting diminish the usefulness and need for PLC by utilities. The IEEE/PSRC asks the Commission to further investigate utilities reliance on PLC and how it is used, if they question its necessity.

Respectfully Submitted,

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